

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 31 OCT 2000

WIPO PCT

Applicant's or agent's file reference 00P026:RC:	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International application No. PCT/AU00/00156	International filing date (<i>day/month/year</i>) 6 March 2000	Priority Date (<i>day/month/year</i>) 5 March 1999
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ A43B 7/34, 13/02, 13/12, 13/38		
Applicant FOOTFRIDGE PTY LTD et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheet(s).

3. This report contains indications relating to the following items:

I Basis of the report

II Priority

III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

IV Lack of unity of invention

V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

VI Certain documents cited

VII Certain defects in the international application

VIII Certain observations on the international application

Date of submission of the demand 25 September 2000	Date of completion of the report 23 October 2000
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer D. LUM Telephone No. (02) 6283 2544

I. Basis of the report

1. With regard to the elements of the international application:*
- the international application as originally filed.
- the description, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- the claims, pages , as originally filed,
 pages , as amended (together with any statement) under Article 19,
 pages , filed with the demand,
 pages , received on with the letter of
- the drawings, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- the sequence listing part of the description:
 pages , as originally filed
 pages , filed with the demand
 pages , received on with the letter of
2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language which is:
- the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, was on the basis of the sequence listing:
- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. The amendments have resulted in the cancellation of:
- the description, pages
- the claims, Nos.
- the drawings, sheets/fig.
5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-22	YES
	Claims	NO
Inventive step (IS)	Claims 1-22	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-22	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

Claims 1-22 meet the criteria set forth in PCT Article 33(2)-(4) for Novelty, Inventive Step and Industrial Applicability. The prior art published before the priority date does not disclose a heat reflection device for footwear, which includes a sac which contains a heat reflective material therein.

PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU OF PATENT COOPERATION

To:
INTELLPRO
Level 7, Reserve Bank Building
102 Adelaide Street
G.P.O. Box 1339
Brisbane, Queensland 4000
AUSTRALIE

RECEIVED
29 SEP 2000

Date of mailing (day/month/year) 14 September 2000 (14.09.00)		
Applicant's or agent's file reference 00P026		IMPORTANT NOTICE
International application No. PCT/AU00/00156	International filing date (day/month/year) 06 March 2000 (06.03.00)	Priority date (day/month/year) 05 March 1999 (05.03.99)
Applicant FOOTFRIDGE PTY LTD et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

AU, KP, KR, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AL, AM, AP, AT, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EA, EE, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, OA, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on

14 September 2000 (14.09.00) under No. WO 00/53042

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 13 October 2000 (13.10.00)	
International application No. PCT/AU00/00156	Applicant's or agent's file reference 00P026
International filing date (day/month/year) 06 March 2000 (06.03.00)	Priority date (day/month/year) 05 March 1999 (05.03.99)
Applicant O'BRIEN, Peter	

1. The designated Office is hereby notified of its election made:

in the demand filed with the International Preliminary Examining Authority on:

 25 September 2000 (25.09.00)

in a notice effecting later election filed with the International Bureau on:

2. The election was
 was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Claudio Borton
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38



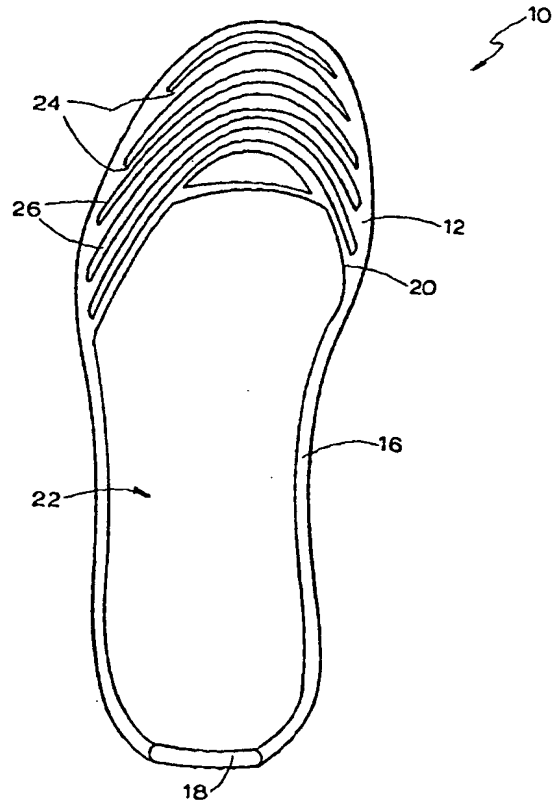
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : A43B 7/34, 13/02, 13/12, 13/38</p>	<p>A1</p>	<p>(11) International Publication Number: WO 00/53042 (43) International Publication Date: 14 September 2000 (14.09.00)</p>
<p>(21) International Application Number: PCT/AU00/00156 (22) International Filing Date: 6 March 2000 (06.03.00) (30) Priority Data: PP 9055 5 March 1999 (05.03.99) AU (71) Applicant (for all designated States except US): FOOTFRIDGE PTY LTD [AU/AU]; 17/10 Purli Street, Chevron Island, QLD 4217 (AU). (72) Inventor; and (75) Inventor/Applicant (for US only): O'BRIEN, Peter [AU/AU]; 78 Thomas Drive, Chevron Island, QLD 4217 (AU). (74) Agent: INTELLPRO; Level 7, Reserve Bank Building, 102 Adelaide Street, G.P.O. Box 1339, Brisbane, Queensland 4000 (AU).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.</p>

(54) Title: HEAT REFLECTION FOOTWEAR DEVICE

(57) Abstract

A heat reflection device (10) is provided for footwear. The device (10) comprises a first layer of fluid-impervious material (12), a second layer of fluid-impervious material (14) and a sac (22) arranged between the first and second layers (12, 14). The sac (22) contains a heat reflective material therein. In use the device (10) is positioned in relation to the sole of the footwear so that at least some heat conducted or converted through the sole is reflected away from a foot of a wearer of the footwear. The heat reflective material may be a mixture having a quantity of heat reflective powder or particulate, a quantity of thickening agent and a quantity of fluid. The heat reflective powder or particulate may be one or a combination of two or more materials selected from titanium dioxide, zirconium and zinc oxide. Preferably the powder or particulate are between 10 to 50 % of the mixture. The thickening agent may be one or a combination of two or more selected from bentonite, attapulite and celluloses. The layers are generally foot shaped and are sealingly joined around the edges thereof by adhesive, fusion, welding or any other known technique.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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EE	Estonia						

HEAT REFLECTION FOOTWEAR DEVICE**TECHNICAL FIELD OF THE INVENTION**

THIS INVENTION relates to a heat deflection device for footwear and in particular but not limited to an inner sole having a sac filled with a flowable slurry containing a heat deflection material for reducing heat transfer from undersole to foot of a wearer and providing a therapeutic effect.

BACKGROUND OF THE INVENTION

Footwear in general has a sole made of rubber, leather or an synthetic or any other suitable material. The sole conducts or convects heat into the interior of the footwear. In warm climate or when it is warm in other regions the heat from the ground is transferred to the foot of a wearer through the sole. As footwear is usually shaped to enclose substantially all of the feet and is generally fairly well insulated against the environment the temperature inside the footwear quickly builds up to a level which is uncomfortable.

As human feet and hands have a relatively higher number of sweat glands per square centimetre than other parts of the body the inside of the footwear also quickly becomes damp due to sweating.

The temperature and dampness inside the footwear promote growth of algae and the footwear becomes unhygienic and usually also has an unpleasant odour. They also affect work efficiency. As much of the heat travels upward to the head and people tend not to concentrate well in this situation.

In recent years many sports such as tennis, hockey and soccer are played on synthetic surfaces, the surface temperatures of which can be as high as 60 to 70 degrees centigrade. The temperature inside the players' footwear is even higher. Long distance runners are also affected by high temperatures in footwear. Many players cannot perform to the level they are capable in this environment. Injuries through sore feet and blisters are also prominent.

An inner sole worn in footwear has been available for sometime as a source of comfort to the wearer. It is usually made of an absorbent foam material. But this inner sole does not reduces the temperature in the footwear and it does not take

long for it to be saturated with sweat and thereafter the wearer continues to suffer the above discomfort.

More recently footwear with ventilation openings for cooling its interior has been introduced into the market. These openings however result in weakened zones and the strength of the footwear is greatly compromised.

OBJECT OF THE INVENTION

An object of the present invention is to alleviate or to reduce to a certain degree one or more of the present invention.

SUMMARY OF THE INVENTION

In one aspect therefor the present invention resides in a heat reflection device for footwear, the device including a first layer of fluid-impervious material, a second layer of fluid-impervious material and a sac arranged between the first and second layers, the sac containing a heat reflective material therein. In use the device is positioned in relation to the sole of the footwear so the at least some heat conducted or conected through the sole is reflected away from a foot of a wearer of the footwear.

It is preferred that the heat reflective material is a mixture having a quantity of heat reflective powder or particulate and a quantity of thickening agent. The mixture may also have a quantity of fluid so that it is flowable.

The heat reflective powder or particulate may be one or a combination of two or more materials selected from titanium dioxide, zirconium and zinc oxide. Preferably the powder or particulate are between 10 to 50% of the mixture. More preferably they are of paint grade particle size.

The thickening agent may be one or a combination of two or more selected from bentonite, attapulite and celluloses. Preferably the agent is between 30 to 90% of the mixture. The thickening agent effects in distributing the powder or particulate more evenly in the sac.

The fluid may be added to a quantity so that the mixture is of a suitable flow quality. The flow quality allows the device to massage the foot when the sac is pressed. This has a therapeutic effect on the user.

The device is generally in the shape of a foot. The sac may extend from about the heel region to about the toe region but typically extends to about the ball region of the foot.

5 Desirably the first and second layers are flexible and made of any suitable impervious material. Polyurethane and other plastic materials are preferred for the layers of the device. More desirably the device is reversible so that either surface of the first and second layers can be used.

10 The layers are generally foot shaped and can be sealingly joined around the edges by adhesive, fusion, welding or any other known technique. It is preferred that radio frequency (RF) welding is employed for the joint. Desirably the sac is also formed during joining of the edges. Where the sac is to extend to about the ball region an additional joint may extend substantially laterally in the ball region.

The device may be a sole or a removable inner sole for the footwear.

15 Advantageously the sole or the inner sole has spaced markings for different shoe sizes so that it can be trimmed according to a marking for desired size.

In order that the present invention can be more readily understood and be put into practical effect reference will now be made to the accompanying drawings which illustrate one preferred embodiment of the invention and wherein:

BRIEF DESCRIPTION OF THE DRAWING

20 Figure 1 is a top plan view of an inner sole according to the invention; and Figure 2 is a bottom plan view of the inner sole shown in Figure 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

25 Referring to Figures 1 and 2 which illustrate an inner sole 10 according to the invention. As can be seen, the inner sole 10 is substantially foot shaped and has superimposed together a first layer 12 and a second layer 14 which are sealingly joined by RF welding around their edges 16 except for a small part 18 of the edges under the heel region. The purpose of the unsealed part will be described later. The layers 12 and 14 in this embodiment are made of a 0.05mm thickness, clear polyurethane material which is impervious to water.

30 A further joint 20 across the ball region defines a sac 22.

The sole 10 has shoe size markings 24 forward of the sac 22 so that it can be trimmed to fit a particular shoe. In this embodiment the markings 24 are also formed by RF welding resulting in raised ribs 26 between adjacent markings 24. The raised ribs 26 are provided on the surface of layer 12 only in this embodiment. But if desired they can be provided on both layers 12 and 14.

The device 10 is reversible as either the surface of layer 12 or the surface of layer 14 can be arranged to contact a wearer's foot.

In manufacturing a mixture of 30-60% bentonite, 10-30% titanium dioxide and about 60% water is poured into the sac 22 through the unsealed part 18. Thereafter part 18 is RF welded so that the sac 22 is fluid tight. The titanium dioxide used for this mixture is paint grade sized powder.

A comparative laboratory test by measuring the temperatures on the surfaces of a known foamed rubber inner sole and the sole of the present invention as described in the above embodiment on a hot plate preheated to 60 degrees Centigrade reveals the following results:

Temp. of hot plate (°C)	Temp. at rubber inner sole surface (°C)	Temp. at inner sole of invention (°C)
60.0	41	34

The above test was carried out when the room temperature was 23 °C and it clearly shows a substantially reduced temperature at the surface of the device 10.

The inventor has found that by increasing the quantity of titanium dioxide in the mixture to 46% the device 10 will become 70% reflective as compared to 43% reflective for the above embodiment.

As the mixture in the sac 22 is flowable the device 10 in use has moving high and low contact points with the foot. This provides a therapeutic massaging effect.

Whilst the above has been given by way of illustrative example of the present invention many variations and modifications thereto will be apparent to

those skilled in the art without departing from the broad ambit and scope of the invention as herein set forth.

CLAIMS

1. A heat reflection device for footwear, the device comprising a first layer of fluid-impervious material, a second layer of fluid-impervious material and a sac arranged between the first and second layers, the sac containing a heat reflective material therein; in use the device is positioned in relation to the sole of the footwear so that at least some heat conducted or convected through the sole is reflected away from a foot of a wearer of the footwear.
2. The device according to claim 1 wherein the heat reflective material is a mixture having a quantity of heat reflective powder or particulate and a quantity of thickening agent.
3. The device according to claim 2 wherein the heat reflective powder or particulate is one or a combination of two or more materials selected from titanium dioxide, zirconium and zinc oxide.
4. The device according to claim 2 or 3 wherein the powder or particulate is between 10 to 50% of the mixture.
5. The device according to any one of claims 2 to 4 wherein the powder or particulate is of paint grade particle size.
6. The device according to any one of claims 2 to 5 wherein the mixture having a quantity of fluid so that it is flowable.
7. The device according to any one of claims 2 to 6 wherein the heat reflective powder or particulate is one or a combination of two or more materials selected from titanium dioxide, zirconium and zinc oxide.
8. The device according to any one of claims 2 to 7 wherein the powder or particulate is between 10 to 50% of the mixture.
9. The device according to any one of claims 2 to 8 wherein the powder or particulate is of paint grade particle size.
10. The device according to any one of claims 2 to 9 wherein the thickening agent is between 30 to 90% of the mixture.
11. The device according to any one of claims 1 to 10 wherein the thickening agent is one or a combination of two or more materials selected from bentonite, attapulgite and celluloses.

12. The device according to claim 6 wherein the fluid is added to a quantity so that the mixture is of a flow quality that allows the device to provide a therapeutic effect on the foot when the sac is pressed.
13. The device according to any one of claims 1 to 12 wherein the device is formed to be generally in the shape of a foot and the sac extending from about the heel region to about the toe or ball region of the foot.
14. The device according to claim 13 wherein the first and second layers are flexible and made of an impervious material.
15. The device according to claim 14 wherein the impervious material is Polyurethane or another plastic material.
16. The device according to any one of claims 13 to 15 wherein the device is reversible so that either surface of the first and second layers can be used.
17. The device according to any one of claims 13 to 16 wherein the layers are sealingly joined around the edges thereof by adhesive, fusion, welding or any other known technique.
18. The device according to claim 17 wherein radio frequency (RF) welding is employed for the joining the edges.
19. The device according to claim 17 or 18 wherein the sac is also formed during joining of the edges and the sac extending to about the ball region
20. The device according to claim 19 wherein the device having an additional joint extending substantially laterally in the ball region.
21. The device according to any one of claims 1 to 20 wherein the device is a sole or a removable inner sole for the footwear.
22. The device according to claim 21 wherein the sole or the inner sole having spaced markings for different shoe sizes so that it can be trimmed according to a marking for a desired size.

1/2

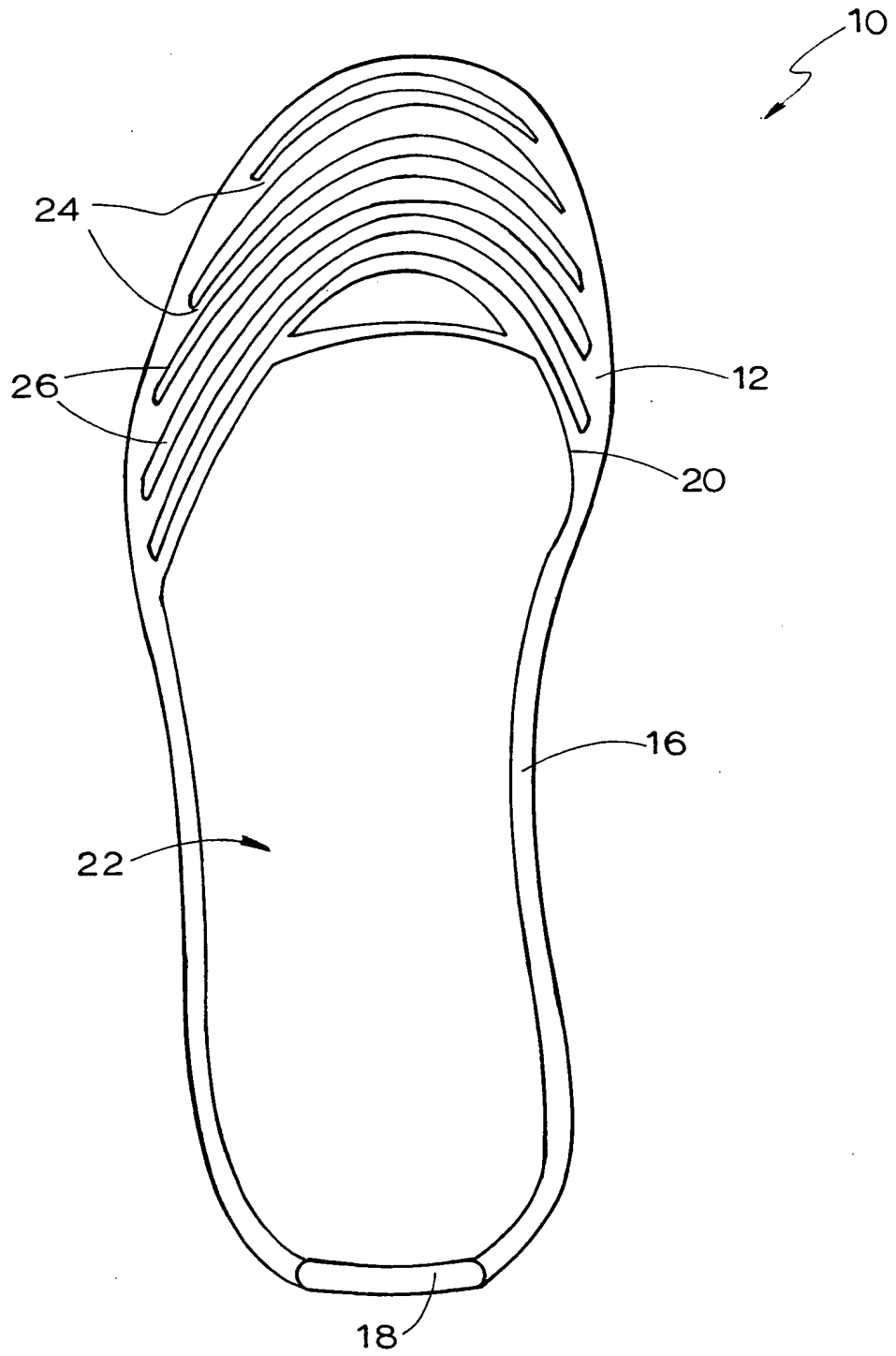


FIG.1.

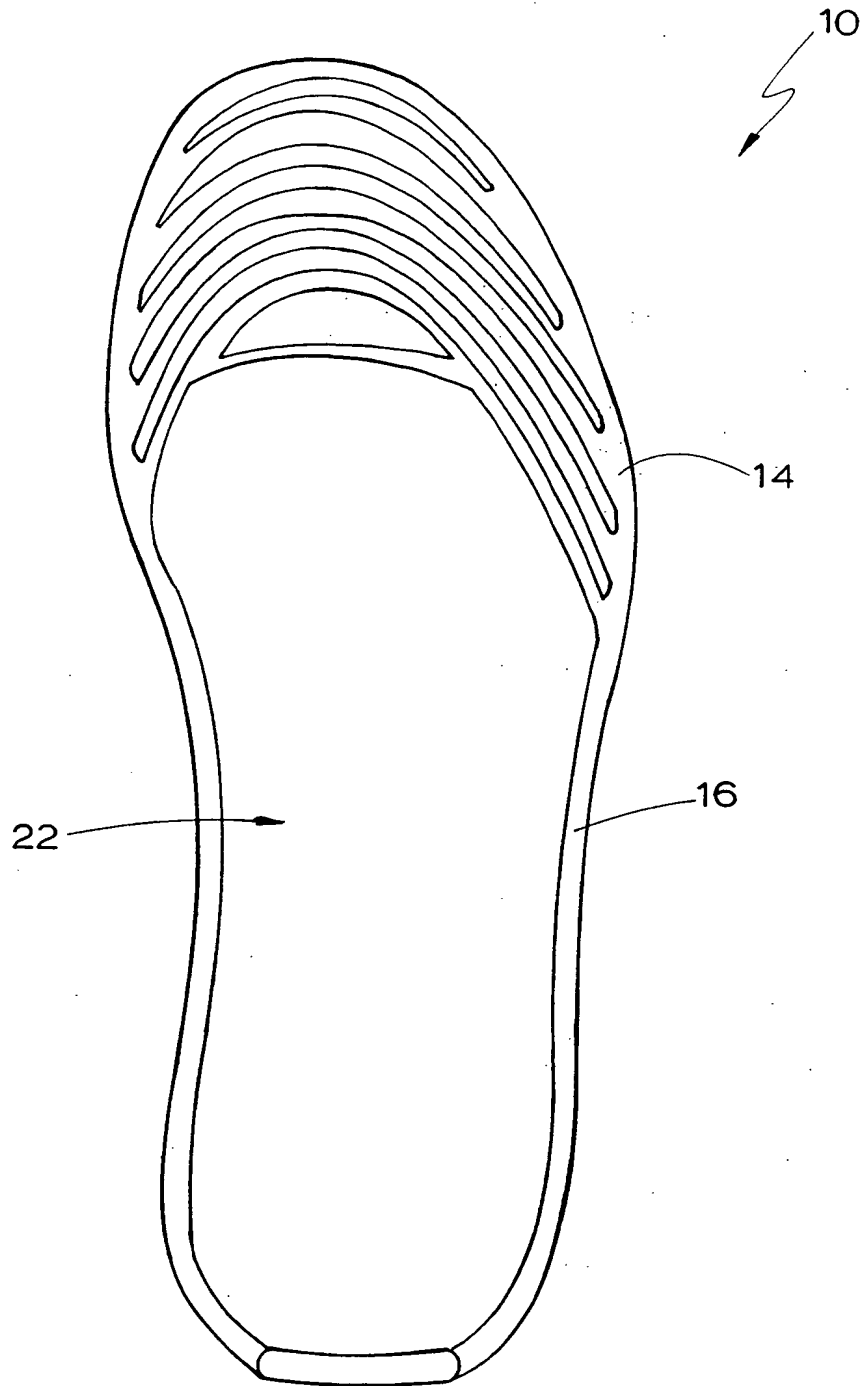


FIG.2.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU00/00156**A. CLASSIFICATION OF SUBJECT MATTER**Int. Cl. ⁷: A43B 7/34, 13/02, 13/12, 13/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
IPC : AS ABOVE

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DERWENT WORLD PATENT INDEX**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2137 866 A (SANDOR) 17 October 1984 Whole document	
A	US 4813160 A (JUZZNETZ) 21 March 1989 Whole document	
A	US 5584130 A (PERRON) 17 December 1996 Whole document	

 Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
13 March 2000Date of mailing of the international search report
17 MAR 2000Name and mailing address of the ISA/AU
AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606, AUSTRALIA
E-mail address: pct@ipaaustralia.gov.au
Facsimile No. (02) 6285 3929Authorized officer
D.R. LUM
Telephone No : (02) 6283 2544

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU00/00156

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
GB	2137866	NIL					
US	4813160	NIL					
US	5584130	CA	2138434				
END OF ANNEX							